

UNIVERSITY OF CALICUT  
SCHOOL OF DISTANCE EDUCATION

B.A. ECONOMICS

(2011 Admission onwards)

III Semester

Core Course

QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS I

Question Bank & Answer Key

Choose the correct Answer from the bracket.

EXPONENTS

1. Find the Value of  $2^3 \times 2^1$

- (a) 16                      (b) 8                      (c) 32                      (d) 64

2. Find the value of  $(27)^{-4/3}$

- (a)  $\frac{1}{9}$                       (b)  $\frac{1}{27}$                       (c)  $\frac{1}{81}$                       (d)  $\frac{1}{3}$

3. Find the value of  $(.001)^{1/3}$

- (a) .001                      (b) .1                      (c) .01                      (d) .0001

4.  $\frac{(a^6 b^{3/4} c^3)^{-2/3}}{(a^2 b^{-1/3} c^{-2})^{3/2}}$  is

- (a)  $a/a^7$                       (b)  $c/a^7$                       (c)  $c/a^{-7}$                       (d)  $b/a^7$

5. The value of  $(-2)^{5/2}$  is

- (a)  $\sqrt{-32}$                       (b)  $\sqrt{32}$                       (c)  $\sqrt{16}$                       (d)  $\sqrt{-16}$

6.  $36x^7y^4 \div 4x^6y$  is

- (a)
- $9x^2y^3$
- (b)
- $9xy^3$
- (c)
- $9y^3x^2$
- (d)
- $9x^{7/6}y^4$

7.  $3 \times 3^5$  is equal to

- (a)
- $9^5$
- (b)
- $6^5$
- (c)
- $3^5$
- (d)
- $3^6$

8.  $8^3/2$  is equal to

- (a)
- $8^3$
- (b)
- $2^3$
- (c)
- $2^8$
- (d)
- $4^3$

9.  $10^0$  is equal to

- (a) 10 (b) 1 (c) 0 (d) 100

10. If  $x^2=1$ ,  $x^{-2}$  is equal to

- (a) 2 (b) -2 (c) 0 (d) 1

11.  $x^m \times x^n$  is \_\_\_\_\_

- (a)
- $x^m$
- (b)
- $x^{m+n}$
- (c)
- $x^{mn}$
- (d)
- $x^n$

12.  $a^m \times a^0$  is equal to

- (a)
- $a^m$
- (b) 0 (c) m (d)
- $a^0$

13.  $2^{-3}$  is equal to

- (a) 8 (b)
- $1/8$
- (c) 2 (d) 3

14.  $3 \times 27^x = 9^{x+4}$  value of  $x$  is

- (a) 7 (b) 3 (c) 9 (d) 5

15.  $(x^5 \times x^{5/2})^{4/5}$  is

- (a)
- $x^6$
- (b)
- $x^5$
- (c)
- $x^{5/2}$
- (d)
- $x^{4/5}$

16.  $\left(x^5/x^9\right)^2$  is

- (a)
- $1/x^9$
- (b)
- $1/x^8$
- (c)
- $x^9$
- (d)
- $x^5$

17.  $(6a^3b^2)(8a^4b^5)$  is

- (a)
- $8a^{12}b^{10}$
- (b)
- $48a^7b^7$
- (c)
- $48a^3b^2$
- (d)
- $48a^4b^5$

18.  $a^m \div a^n$  is

- (a)
- $a^{m/n}$
- (b)
- $a^{m-n}$
- (c)
- $a^{mn}$
- (d)
- $a^{m+n}$

19.  $\left(\frac{10^8}{10^5}\right)^{1/3}$  is

- (a) 10 (b)
- $10^{8/3}$
- (c)
- $10^{5/3}$
- (d)
- $10^{8/5}$

20.  $\frac{32^{n+1} + 2^n}{2^{n+2} - 2^{n-1}}$  is equal to

- (a) 2 (b) 3 (c) 1 (d) 4

### LOGARITHMS

21.  $\log_3 3 =$

- (a) 3 (b) 9 (c) 1 (d) 0

22.  $\log_b a \times \log_a b$  is equal to

- (a) 1 (b)
- $a$
- (c)
- $b$
- (d) 0

23.  $\log_2 1$  is  
(a) 2 (b) 1 (c) 0 (d) 3
24.  $\log_a(1/b) =$   
(a)  $\log_a b$  (b)  $-\log_a b$  (c)  $\log_b a$  (d)  $-\log_b a$
25.  $\log_{\sqrt{2}} 8$  is  
(a) 6 (b) 4 (c) 8 (d) 2
26. The characteristic of the logarithm of 83.2 is  
(a) 1 (b) 2 (c) 3 (d) 0
27. The characteristic of the logarithm of .0032 is  
(a) 1 (b) -1 (c) -2 (d) -3
28. Antilogarithm of 2.4678 is  
(a) 2936 (b) 2931 (c) 2935 (d) 2930
29. Find the number of zeros in  $3^{-25}$  immediately after the decimal point.  
(a) 12 (b) 11 (c) 10 (d) 9
30. Find the logarithms of 125 to the base 5  
(a) 3 (b) 1 (c) 2 (d) 5
31. Change into the logarithm form  $6^3 = 216$   
(a)  $\log_6 216 = 3$  (b)  $\log_3 6 = 216$  (c)  $\log_6 3 = 216$  (d)  $\log_3 216 = 6$
32.  $\log_{16} 64$  is equal to  
(a)  $2/3$  (b)  $3/2$  (c)  $1/2$  (d) 2

EQUATION

33. Find the value of  $4x = 8$
- (a) 4                      (b) 8                      (c) 2                      (d)  $1/2$
34.  $7x - 21 - 3x + 13 = 7 + 6x - 19$  is equal to
- (a) 2                      (b) 1                      (c) 3                      (d) .5
35. If in the equation  $ax^2 + bx + c = 0$ ,  $b$  is zero, then the equation is called \_\_\_\_\_
- (a) *simple linear*      (b) *pure quadratic*      (c) *general quadratic*      (d) *none*
36. The  $ss$  and  $dd$  curves for a commodity are known to be  $qs = P - 1$  and  $qd = 12/p$ .  
Find the equilibrium price.
- (a) 4                      (b) 2                      (c) 6                      (d) 5
37. The quantity  $b^2 - 4ac$  is called \_\_\_\_\_ of the quadratic equation.
- (a) *roots*                      (b) *discriminant*      (c) *power*                      (d) *none*
38.  $b^2 - 4ac = 0$ , the roots are
- (a) *real and equal*    (b) *rational and unequal*  
(c) *irrational and unequal*    (d) *unreal*
39. Find the value of  $K$  for which  $x^2 - 2kx + 8k - 15 = 0$  has equal roots.
- (a) 3,6                      (b) 3,5                      (c) 5,3                      (d) 5,6
40.  $(x + 2)^2 = x^2 + 4x + 4$  is known as.
- (a) *equation*                      (b) *identity*                      (c) *both*                      (d) *none*
41. Sum of the roots of quadratic equation.
- (a)  $b/a$                       (b)  $-b/a$                       (c)  $a/b$                       (d)  $-a/b$

42. Product of the roots of quadratic equations are.

- (a)  $c/a$                       (b)  $-c/a$                       (c)  $a/c$                       (d)  $-c/a$

## PROGRESSIONS

### Arithmetic Progression

43. A series is said to be in Arithmetic Progression, if any term of it is obtained by adding a constant number to its \_\_\_\_\_ term.

- (a) *succeeding*      (b) *preceeding*      (c) *preceeding and succeeding*      (d) *none*

44. The  $n^{th}$  term of an Arithmetic Progression.

- (a)  $a + (n - 1)d$     (b)  $a + n(n - 1)d$   
 (c)  $a + (n - 1) + d$     (d)  $a + (n - 1) - d$

45. 12<sup>th</sup> term of the series 9 + 13 + 17 + 21 + .....

- (a) 52                      (b) 53                      (c) 54                      (d) 55

46. The sum of first n natural numbers.

- (a)  $\frac{n(n+1)}{2}$                       (b)  $\frac{n^2(n+1)}{2}$                       (c)  $n(n + 1)2$                       (d) *none*

47. The first term of an Arithmetic Progression is 5, the last term is 45,  $S_n = 400$ , n is equal to

- (a) 13                      (b) 16                      (c) 18                      (d) 9

48. The arithmetic mean between 8 and 14 is equal to

- (a) 3,6                      (b) 3,5                      (c) 5,3                      (d) 5,6

49. The  $n^{th}$  term of G.P. is

- (a)  $r^{n-1}$                       (b)  $\frac{r^{n-1}}{2}$                       (c)  $ar^{n-1}$                       (d)  $\frac{r^{n-1}}{a}$

50. when  $r < 1$ , the sum of  $n$  terms of G.P. is  
 (a)  $\frac{a(r^n-1)}{r-1}$                       (b)  $\frac{a(1-r^n)}{1-r}$                       (c) both                      (d) none
51. The sum of infinite G.P. 16, 8, 4, .....  
 (a) 32                      (b) 8                      (c) 16                      (d) 2
52. G.M. between 18 and 162  
 (a) 22                      (b) 120                      (c) 90                      (d) 54

**SET THEORY**

53. In a set theory, the set of numbers 1, 3, 5, 7, 9 ..... can be represented by  $A = \{X: X \text{ is an odd integer}\}$  is a \_\_\_\_\_ method.  
 (a) *Tabular Method*                      (b) *Rule method*  
 (c) *Roster method*                      (d) *Enumeration Method*
54. Two sets  $A = \{1,3,4,7\}$  and  $B = \{7,3,1, 4\}$  are said to be  
 (a) *Equality of sets*                      (b) *Equivalent sets*  
 (c) *Null set*                      (d) *Singleton*
55. A set which contains only one element is called  
 (a) *Null set*                      (b) *Equal set*                      (c) *Singleton*                      (d) *none*
56. The subset of every set  
 (a) *Singleton*                      (b) *Equal Set*                      (c) *Null set*                      (d) *none*
57. The set  $\emptyset$  is represented by  
 (a) *singleton*                      (b) *Null*                      (c) *Both*                      (d) *none*
58.  $\lim_{x \rightarrow 2} \frac{x^2-4}{x-2}$  is  
 (a) 0                      (b)  $\infty$                       (c) 4                      (d) -4

59.  $\lim_{x \rightarrow 2} x^2 + 7$  is
- (a) 32                      (b) 39                      (c) 8                      (d) *None of the above*
60. A function is continuous if
- (a)  $\lim_{x \rightarrow a} f(x) = f(a)$  exist                      (c) Both 'a' and 'b'
- (b)  $f(a)$  is a finite quantity                      (d) None of the above
61.  $\lim_{x \rightarrow 1} \frac{4x^4 + 3x^3 - 1}{x^2 + 1}$  is
- (a)  $\frac{4}{5}$                       (b)  $\frac{4}{3}$                       (c)  $\frac{4}{7}$                       (d)  $\frac{3}{4}$
62. The derivative of  $e^{x^2}$  is
- (a)  $e^{x^2}$                       (b)  $e^{2x}$                       (c)  $2e^x$                       (d)  $2x e^{x^2}$
63. The minimum of the function  $y = 4x^2 + 8$  is at
- (a)  $x = 0$                       (b)  $x = 8$                       (c)  $x = 4$                       (d) *None of these*
64. Derivative of  $\frac{1}{x^2}$  is
- (a)  $-x^2$                       (b)  $-2x^{-3}$                       (c)  $2x^{-3}$                       (d) *None of these*
65. If  $T = 10 + 2x + 3x^2$  be the cost function then the slope of the average cost be
- (a)  $2+6x$                       (b)  $2x + 3x^2$                       (c)  $\frac{-10}{x^2} + 8$                       (d)  $2x^2 + 4x^3$



66. The derivative of  $x^2 e^x$  is

- (a)  $(x^2 + 2)e^x$       (b)  $(x^2 + 2x)e^x$       (c)  $x^2 e^x$       (d)  $(2x + 1)e^x$

67. If  $y = \sqrt[3]{x} \frac{dy}{dx}$  is

- (a)  $3x$       (b)  $\frac{1}{3} x^{-2/3}$       (c)  $\frac{2}{3} x^{1/3}$       (d)  $\frac{1}{3} x$

68. Derivative of  $e^x$  is

- (a)  $x e^{x-1}$       (b)  $e^x$       (c)  $\log e^x$       (d)  $\frac{1}{e^x}$

69. The derivative of  $\log x$

- (a)  $x \log x$       (b)  $\log x^2$       (c)  $x$       (d)  $\frac{1}{x}$

70.  $\frac{d}{dx} x^{-3}$  is

- (a)  $3 x^{-4}$       (b)  $-3x^{-2}$       (c)  $3x^{-4}$       (d)  $3x^{-2}$

71. If  $y = \frac{x}{2x}$  the derivative is

- (a) 0      (b)  $\frac{1}{2}$       (c)  $2x^2$       (d) *None of these*

72.  $\frac{d}{dx} x \log x$  is

- (a)  $\frac{1}{x}$       (b)  $1 + \log x$       (c)  $1 \log x$       (d) *None of these*

73.  $xy = c^2$  the derivative is

- (a)  $\frac{y}{x}$       (b)  $\frac{x}{y}$       (c)  $-\frac{x}{y}$       (d)  $-\frac{y}{x}$

74. A function is said to be maximum at  $x = a$  if
- $f'(a)$  is negative and  $f''(a)$  zero
  - $f'(a)$  is zero and  $f''(a)$  is negative
  - $f'(a)$  is zero and  $f''(a)$  is zero
  - $f'(a)$  is negative and  $f''(a)$  is negative
75. A function is said to be minimum
- $f' = 0$  and  $f'' > 0$
  - $f' = 0$  and  $f'' < 0$
  - $f' > 0$  and  $f'' = 0$
  - $f' < 0$  and  $f'' = 0$
76. The function  $2x^2 - 8x + 10$  is minimum at ' $x$ ' is equal to
- 4
  - 8
  - $2x$
  - 2
77. At  $x = 2$  the function  $-3x^2 + 12x + 5$  is
- maximum
  - minimum
  - Point of Inflection
  - None of the above
78. When Revenue is maximum if  $R = 3000 - (3 - x)^2$
- 9
  - 9
  - 3
  - 3
79. Increasing function if and only if its derivatives on  $(a, b)$  is
- Negative
  - Non - Negative
  - Non-positive
  - None of the above
80. The function  $3x^3 + 3x^2 + x - 10$  is
- An increasing function
  - Decreasing function
  - Standard function
  - None of the above

81. If the second derivative of a function  $f(x)$  is positive then in the given interval the function is said to be  
 (a) *Increasing*      (b) *Decreasing*      (c) *Convex*      (d) *Concave*
82. The differential Coefficient of the dependent variable with respect to one of the independent variables keeping the other independent variable is constant is called  
 (a) *Simple derivative*      (b) Total derivative  
 (c) Partial derivative      (d) Cross derivative

### BASIC MATRIX ALGEBRA

83. A triangular matrix is the one in which  
 a. All the diagonal elements are zero  
 b. All the elements above or below the diagonal are zero  
 c. All diagonal elements are non-zero  
 d. All the elements are unity
84. If  $A = A^T$ , the A is called  
 a. Square matrix      c. Orthogonal matrix  
 b. Skew symmetric matrix      d. Symmetric Matrix
85. When the determinant of a matrix is zero, the matrix is called  
 a. Singular      c. Null  
 b. Non singular      d. Identity
86. Given A is  $2 \times 2$  matrix and B is  $2 \times 3$ , the matrix AB will be  
 a.  $2 \times 2$       b.  $2 \times 3$       c.  $3 \times 3$       d.  $3 \times 2$
87. If the two rows or columns are identical or proportional, the determinant is  
 a. One      b. Infinity      c. Undefined      d. Zero
88. The transpose of a matrix of minors is called  
 a. Adjoint      b. Cofactor      c. Determinant      d. Inverse

89.  $AA^{-1} = \text{-----} = A^{-1}A$
- A
  - $A^{-1}$
  - I
  - None of the above
90. For a matrix minor  $M_{12} = -34$ , then the cofactor  $C_{12}$  will be
- 34
  - 17
  - 34
  - 0
91. The linear form  $AX = B$  implies that
- $X = A^{-1}B$
  - $X = B^{-1}A$
  - $X = AB$
  - $X = BA^{-1}$
92. The determinant is defined only for
- Row matrix
  - Column matrix
  - Square matrix
  - Null matrix
93. Matrix B is called Skew symmetric if
- $B = B^T$
  - $B = B^2$
  - $B = -B^T$
  - None of the above
94. If the two matrices are of the order  $m \times n$  and  $n \times p$ , then AB will of the dimension
- $p \times n$
  - $m \times p$
  - $n \times p$
  - $m \times n$
95. If  $A = A^2$ , the matrix A is known as
- Symmetric
  - Skew Symmetric
  - Idempotent
  - Triangular

96. If  $A \times A = A$ , then the matrix  $A$  is
- a. Nil potent
  - b. Symmetric
  - c. Triangular
  - d. Identity
97. If the determinant of a matrix is found out to be -65, the determinant of its transpose is
- a. -65
  - b. 65
  - c. 32.5
  - d. Cannot say
98. A square matrix in which all the diagonal elements are equal and non-diagonal elements are zero is called
- a. Diagonal matrix
  - b. Scalar matrix
  - c. Triangular matrix
  - d. Unit matrix
99. The determinant of  $3 \times 3$  matrix is called
- a. First order determinant
  - b. Second order determinant
  - c. Third order determinant
  - d. Fourth order determinant
100. A matrix with equal number of rows and column is called
- a. Square matrix
  - b. Row matrix
  - c. Column matrix
  - d. Null matrix
101. A diagonal matrix with each of the diagonal elements is unity is
- a. Vector
  - b. Square matrix
  - c. Diagonal matrix
  - d. Identity matrix
102. If in a square matrix, all the elements below the leading diagonal is zero, it is
- a. Lower triangular matrix
  - b. Upper triangular matrix
  - c. Identity matrix
  - d. Null matrix
103. The maximum number of linearly independent rows or columns in the matrix is called
- a. Determinant
  - b. Trace
  - c. Rank
  - d. Minor

104. The determinant of the triangular matrix is the product of
- |            |                     |
|------------|---------------------|
| a. Rows    | c. Rows and columns |
| b. Columns | d. Diagonals        |
105. Minor with the prescribed sign is called
- |             |                |
|-------------|----------------|
| a. Inverse  | c. Determinant |
| b. Cofactor | d. Adjoint     |
106. The transpose of the cofactor matrix is
- |             |            |
|-------------|------------|
| a. Cofactor | c. Inverse |
| b. Rank     | d. Adjoint |
107. For a square matrix, inverse exists if and only if it is
- |                 |               |
|-----------------|---------------|
| a. Non-singular | c. Null       |
| b. Singular     | d. Cannot say |

### FUNCTIONS AND GRAPHS

108. A \_\_\_\_\_ is a value that may change within the scope of a given problem or set of operations
- (a) constant  
 (b) variable  
 (c) function  
 (d) exponent
109. Given  $y = f(x)$ , 'y' is called a \_\_\_\_\_ variable and 'x' is called an \_\_\_\_\_ variable.
- (a) independent, dependent  
 (b) variable, constant  
 (c) constant, variable  
 (d) dependent, independent
110. In  $y = f(x)$ , 'y' is called \_\_\_\_\_ and 'x' is called \_\_\_\_\_
- (a) output, input  
 (b) variable, constant  
 (c) input, output  
 (d) constant, variable

111. \_\_\_\_\_ represents a response, behaviour, or outcome that the researcher wishes to predict or explain.
- (a) independent variable
  - (b) function
  - (c) equation
  - (d) dependent variable
112. \_\_\_\_\_ variable is a factor that is not itself under study but affects the measurement of the study variables or the examination of their relationships.
- (a) Exogenous
  - (b) Endogenous
  - (c) Extraneous
  - (d) Dependent
113. If a term consists of only variables, its coefficient is
- (a) 1
  - (b) does not exist
  - (c) 0
  - (d) unknown
114. Expressions consisting of a real number or of a coefficient times one or more variables raised to the power of a positive integer are called .....
- (a) polynomials
  - (b) monomials
  - (c) functions
  - (d) equations
115. In a variable expressions  $5a + 3b$ , 'a' and 'b' are \_\_\_\_\_, 5 and 3 are and + is an \_\_\_\_\_
- (a) variables, constants, operator
  - (b) constants, variables, operator
  - (c) operator, variables, constants
  - (d) variables, operator, constants
116. A \_\_\_\_\_ is an equation for which any  $x$  that can be plugged into the equation will yield exactly one  $y$  out of the equation
- (a) monomial
  - (b) polynomial
  - (c) function
  - (d) operator

117. To plot a graph of a function, as a matter of convention, we plot the independent variable on the \_\_\_\_\_ axis of a graph, and the dependent variable on the \_\_\_\_\_ axis.
- (a) horizontal, vertical
  - (b) vertical, horizontal
  - (c) vertical or horizontal
  - (d) vertical and horizontal
118. \_\_\_\_\_ functions take the form  $y = a + qx$
- (a) Power
  - (b) Quadratic
  - (c) Linear
  - (d) Exponential
119. \_\_\_\_\_ functions take the form  $y = a + kx^p$
- (a) Power
  - (b) Quadratic
  - (c) Linear
  - (d) Exponential
120. If the relation between two variables  $x$  and  $y$  is expressed in the form  $f(x,y)=0$ , where  $x$  cannot be expressed as a function of  $y$ , or  $y$  cannot be expressed as a function of  $x$ , is called \_\_\_\_\_ function.
- (a) Quadratic function
  - (b) implicit
  - (c) explicit
  - (d) Linear function
121. The graph of \_\_\_\_\_ function is such that the two ends of the graph will be directed towards the same side.
- (a) odd
  - (b) implicit
  - (c) power
  - (d) even
122. A function  $f(x)$  has an inverse function if and only if  $f(x)$  is
- (a) one-to-one
  - (b) one-to-many
  - (c) many-to-one
  - (d) one-to-two



123. In the rectangular coordinate system the coordinates of the origin are  $(0,0)$ . This notation is called
- (a) cartesian product
  - (b) ordered pair
  - (c) Determinant
  - (d) None of these
124. In the rectangular coordinate system, in quadrant IV,  $x$  is always \_\_\_\_\_ and  $y$  is always \_\_\_\_\_
- (a) negative, positive
  - (b) negative, negative
  - (c) positive, negative
  - (d) positive, positive
125. The distance formula can be obtained by creating a triangle and using the Pythagorean Theorem to find the length of the
- (a) arc
  - (b) slope
  - (c) graph
  - (d) hypotenuse
126. The \_\_\_\_\_ is an ordered pair formed by finding the average of the  $x$ -values and the average of the  $y$ -values of the given points
- (a) arc
  - (b) slope
  - (c) midpoint
  - (d) hypotenuse
127. The \_\_\_\_\_ of a line measures the change in  $y$  ( $\Delta y$ ) divided by change in  $x$  ( $\Delta x$ ).
- (a) slope
  - (b) arc
  - (c) hypotenuse
  - (d) midpoint
128. The \_\_\_\_\_ the absolute value of the slope, the \_\_\_\_\_ the line.
- (a) steeper, greater
  - (b) greater, steeper
  - (c) greater, flatter
  - (d) lesser, steeper

129. The slope of a vertical line (for example a perfectly inelastic demand curve), for which  $\Delta x = 0$ , is
- (a) 0
  - (b) 1
  - (c) -1
  - (d) undefined
130. The x \_\_\_\_ is the point where your line crosses the x-axis.
- (a) intercept
  - (b) slope
  - (c) arc
  - (d) quadrant
131. A \_\_\_\_ is a relation (usually an equation) in which no two ordered pairs have the same x-coordinate when graphed.
- (a) graph
  - (b) quadratic equation
  - (c) function
  - (d) linear equation
132. Point-slope refers to a method for graphing \_\_\_\_\_ equation on an x-y axis.
- (a) a linear
  - (b) a quadratic
  - (c) a non linear
  - (d) a cubic

### FINANCIAL MATHEMATICS

133. \_\_\_\_\_ is the amount by which a variable increases over a given period of time as a percentage of its previous value
- (a) GDP
  - (b) Interest Rate
  - (c) Growth Rate
  - (d) Compounding
134. A 3% growth rate in GDP for a year means that the value of an economy is \_\_\_\_ % of the value of the previous year
- (a) 103
  - (b) 30
  - (c) 300
  - (d) 3

135. The \_\_\_\_ growth rate pays a fixed amount of return over time.  
(a) compound  
(b) complex  
(c) multiple  
(d) simple
136. A \_\_\_\_ growth rate is exponential  
(a) compound  
(b) complex  
(c) multiple  
(d) simple
137. Albert Einstein called \_\_\_\_\_ interest “the greatest mathematical discovery of all time”.  
(a) simple  
(b) compound  
(c) multiple  
(d) gross
138. The \_\_\_\_\_ is the rate at which something (e.g., revenue, savings, population) grows over a period of years, taking into account the effect of annual compounding.  
(a) simple annual growth rate  
(b) multiple annual growth rate  
(c) compounded annual growth rate  
(d) GDP
139. \_\_\_\_\_ may be defined as a method of allocating the cost of a tangible asset over its useful life  
(a) Compounding  
(b) Deflating  
(c) Inflating  
(d) Depreciation
140. ‘The concept is based on the concept that a rupee that you have today is worth more than the promise or expectation that you will receive a rupee in the future.’ Which concept is being referred to here  
(a) time value of money  
(b) compounding  
(c) depreciation  
(d) simple annual growth rate

141.  $P(1+i)^n$   
(a) Future value  
(b) Present Value  
(c) Time value of money  
(d) Compounding
142. The PV of net benefits of a series of a project is called \_\_\_\_  
(a) Compounding  
(b) NPV  
(c) future value  
(d) present Value
143. \_\_\_\_ finds the future value of a present value using a compound interest rate  
(a) Discounting  
(b) Time value of money  
(c) Compounding  
(d) NPV
144. \_\_\_\_ finds the present value of some future value, using a discount rate.  
(a) Discounting  
(b) Compounding  
(c) Time value of money  
(d) NPV
145. A set of cash flows that are equal in each and every period is called  
(a) annuity  
(b) compounding  
(c) discounting  
(d) NPV
146. \_\_\_\_\_ is an annuity with an infinite life  
(a) NPV  
(b) Interest  
(c) Perpetuity  
(d) Time value of money
147. \_\_\_\_\_ is the process by which the firm decides which long-term investments to make.  
(a) Compounding  
(b) Perpetuity  
(c) Discounting  
(d) Capital Budgeting

148. \_\_\_\_\_ of a Capital Budgeting project is the discount rate at which the Net Present Value of a project equals zero
- (a) Compounding
  - (b) Perpetuity
  - (c) The Internal Rate of Return
  - (d) Discounting
149. This is derived by dividing the discounted costs by the discounted benefits is known as
- (a) Benefit-cost ratio
  - (b) NPV
  - (c) PV
  - (d) Benefit - cost multiple
150. The average rate of return on investment costs over the life of the project is called
- (a) NPV
  - (b) Internal rate of return
  - (c) PV
  - (d) CRR
151. \_\_\_\_\_ is the actual inflow and outflow of funds from a company.
- (a) Cash flow
  - (b) NPV
  - (c) PV
  - (d) Benefit-cost ratio
152. \_\_\_\_\_ is a measure that allows us to see how quickly the initial investment is returned to us
- (a) NPV
  - (b) Payback
  - (c) PV
  - (d) CRR
153. What is 'the appropriate value of  $r$  to use in computing present discount value for social investments'
- (a) benefit - cost multiple
  - (b) benefit-cost ratio
  - (c) social discount rate
  - (d) CRR

**ANSWER KEY**

1. (a) 16
2. (c)  $1/81$
3. (b) .1
4. (b)  $c/a^7$
5. (a)  $\sqrt{-32}$
6. (b)  $9xy^3$
7. (d)  $3^6$
8. (c)  $2^8$
9. (b) 1
10. (d) 1
11. (b)  $x^{m+n}$
12. (a)  $a^m$
13. (b)  $1/8$
14. (a) 7
15. (a)  $x^6$
16. (b)  $1/x^8$
17. (b)  $48a^7b^7$
18. (b)  $a^{m-n}$
19. (a) 10
20. (a) 2
21. (c) 1
22. (a) 1
23. (c) 0
24. (b)  $\log_a b$
25. (a) 6
26. (a) 1
27. (d) 3
77. (a) maximum
78. (d) 3
79. (b) Non-Negative
80. (a) An increasing function
81. (c) convex
82. (c) Partial derivative
83. (b) All the elements above or below the diagonal are zero
84. (d) Symmetric Matrix
85. (a) Singular
86. (b) 2x3
87. (d) Zero
88. (b) cofactor
89. (c) I
90. (a) 34
91. (a)  $X= A-1B$
92. (c) Square Matrix
93. (c)  $B=-BT$
94. (b)  $M \times p$
95. (c) Idempotent
96. (d) Identity
97. (a) -65
98. (a) Diagonal matrix
99. (c) Third order determinant
100. (a) Square matrix
101. (d) Identity matrix
102. (b) Upper triangular matrix
103. (c) Rank

28. (a) 2936
29. (b) 11
30. (a) 3
31. (a)  $\log_6 216=3$
32. (b)  $\frac{3}{2}$
33. (c) 2
34. (a) 2
35. (b) Pure Quadratic
36. (a) 4
37. (b) discriminant
38. (a) real and equal
39. (c) 5, 3
40. (b) identity
41. (b)  $\frac{b}{a}$
42. (a)  $\frac{c}{a}$
43. (b) preceding
44. (a)  $a + (n - 1) d$
45. (b) 53
46. (a)  $\frac{n(n+1)}{2}$
47. (b) 16
48. (a) 11
49. (c)  $ar^{n-1}$
50. (b)  $\frac{a(1 - r^n)}{1 - r}$
51. (a) 32
52. (d) 54
53. (b) Rule Method
54. (a) Equality of sets
55. (c) Singleton
56. (c) Null set
- 104 (d) Diagonals
- 105 (b) Cofactor
- 106 (d) Adjoint
- 107 (a) Non-singular
- 108 (b) variable
- 109 (d) dependent, independent
110. (a) output, input
111. (d) dependent variable
112. (c) Extraneous
- 113 (a) 1
114. (b) monomials
- 115 (a) variables, constants, operator
- 116 (c) function
- 117 (a) horizontal, vertical
- 118 (d) Exponential
- 119 (a) Power
120. (b) implicit
121. (d) even
122. (a) one-to-one
- 123 (b) ordered pair
124. (c) positive, negative
125. (d) hypotenuse
126. (c) midpoint
127. (a) slope
128. (b) greater, steeper
129. (d) undefined
130. (a) intercept
131. (c) function
132. (a) a linear

57. (b) Null set
58. (c) 4
59. (b) 39
60. (c) Both 'a' and 'b'
61. (d)  $\frac{3}{4}$
62. (d)  $2x e^{x^2}$
63. (a)  $x = 0$
64. (b)  $-2x^{-3}$
65. (c)  $\frac{-10}{x^2} + 8$
66. (b)  $(x^2 + 2x)e^x$
67. (b)  $\frac{1}{3}x^{-2/3}$
68. (b)  $e^x$
69. (d)  $\frac{1}{x}$
70. (a)  $-3x^{-4}$
71. (a) '0'
72. (b)  $1 + \log x$
73. (d)  $^{-y}/x$
74. (b)  $f'(a)$  is zero at  $f''(a)$  is negative
75. 75. (a)  $f' = 0$  and  $f'' > 0$
76. 76. (d) 2
133. (c) Growth Rate
134. (a) 103
135. (d) simple
136. (a) compound
137. (b) compound
138. (c) compounded annual growth rate
139. (d) Depreciation
140. (a) time value of money
141. (a) Future value
142. (b) NPV
143. (c) Compounding
144. (a) Discounting
145. (a) annuity
146. (c) Perpetuity
147. (d) Capital Budgeting
148. (c) The Internal Rate of Return
149. (a) Benefit-cost ratio
150. (b) Internal rate of return
151. (a) Cash flow
152. (b) Payback
153. (c) social discount rate

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